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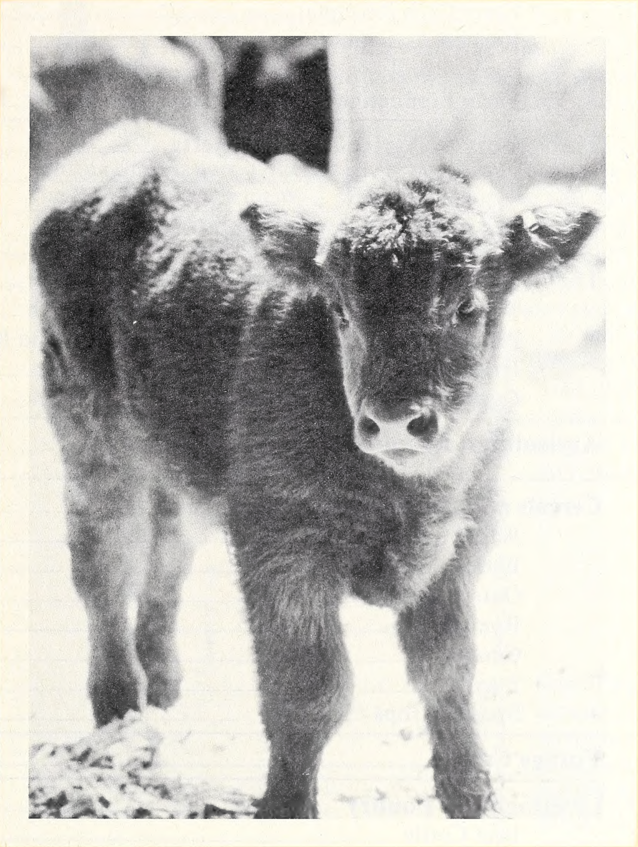

# AGRICULTURE in ALBERTA

Alberta
AGRICULTURE

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# PART 1: AN OVERVIEW

## Agriculture's Place in the Alberta Economy

Little more than a century ago, Canada was a new nation. Pockets of settlement dotted that part of the great Northwest now known as the Province of Alberta, but for the most part the region remained what it had been since the glaciers departed: unbroken prairie to the south and east, rolling parkland dotted with trees and lakes across the central part, and in the north and west, thickly forested expanses.

During the last part of the nineteenth century, the young nation began to open the Prairies to settlement — primarily to tap the vast agricultural potential of the area. In the total span of human history one century is a very short time, but in that period the prairie sod has been turned and forested areas cleared. Dots on a railway map became villages and towns, and some of the towns became cities, all largely a result of the prosperous agriculturally based economy. Today about 56,000 farms occupy nearly 50 million acres (20 million hectares) of farm land. Those farms, and the processing and service industries that accompany them, make agriculture the second most important area of economic activity in Alberta (after the oil and natural gas industry). And because agriculture is a renewable resource which, if cared for by present generations, will thrive indefinitely, it is a primary source of the province's economic well-being and stability.

## Farm Cash Receipts

There are many ways of measuring the size and importance of an industry to the economy of a region. Speaking in terms of cash receipts to farmers from the sale of their commodities, agriculture was a $4 billion industry in 1984. The industry that processes these primary agricultural products generates another $4 billion in sales. Another measure is the amount agriculture contributes to export trade. In 1984 farm products from Alberta worth $2.3 billion were shipped to all parts of the world — about one-fifth of all Canadian agricultural exports. In 1984 Albertans working directly in agriculture totalled 88,000. By comparison, all manufacturing employed an equal number, and primary industries other than agriculture employed 74,000. In order to employ those 88,000 people, generate those $4 billion in sales and provide the basis for a processing industry of equal sales requires a huge investment in land, buildings and equipment. In 1985 that investment in Alberta farms amounted to $31.508 billion.

## Related Activities

So far we have spoken mainly of the agricultural industry as that involved with the direct production of primary goods: grains, livestock, poultry, vegetables, forages, honey, dairy products. But any industry of significant size in a region has a "ripple effect" — it produces other economic activity because of its presence. The "value-added activity" associated with agriculture — the further processing of raw farm products — is the most obvious direct outgrowth of the industry. However, there is another whole category of activity that serves agriculture: transportation and communication; the production, wholesaling and retailing of the items farmers buy, and of the products they sell; financial services; professionals such as lawyers, accountants and veterinarians; and finally, the public services such as roads, snow removal, product inspection and education that are necessary to the proper function of the industry. All this adds up to a province where many people's lives are directly affected by the health of agriculture. It is sometimes estimated that three of 10 jobs in some way depend on agriculture.

Alberta has one of the most balanced agricultural economies in Canada. On average, receipts from livestock approximately equal receipts from crop production (in 1985, $1.983 billion for crops and $1.880 billion for livestock and livestock products). Within the livestock and crop segments, there is wide diversity. Beef cattle, dairy cattle, hogs, sheep and poultry are to be found on farms throughout the province. Wheat, barley, oats, rye, flax, canola and numerous varieties of forage crops are grown.

*It is sometimes estimated that three of 10 jobs in some way depend on agriculture.*

The effect of this diversity is important both for individual farmers and the economy as a whole. The overall economic health of an industry depends on the cost of producing the product, the amount produced, the demand for the product, and therefore the price obtained for it. Because of the many factors influencing agricultural production, from climate and weather to government policy, and the global nature of the market for many of the commodities, agriculture is particularly prone to fluctuations in the production and profitability of its products. Farmers who do not depend on just one commodity for their income can weather the inevitable swings in income that occur with single commodity markets. Similarly, regions in which there is varied agricultural production experience a more even, stable overall economic climate, rarely experiencing poor markets for all products simultaneously.

Alberta's farmers are efficient. With just nine per cent of Canada's population, Alberta produces 23 per cent of Canada's agricultural output. Today one Alberta farmer produces enough food to feed 67 people, while 15 years ago that one farmer fed only 45 people. Improved technology and larger equipment have made this possible. The fact that total output from Alberta farms far exceeds what Albertans consume, leaving a surplus which is exported to many countries throughout the world, also has a positive effect on the Canadian economy as a whole. Because of Canada's small population it has always relied heavily on export markets for its goods. It is important for Canada to maintain a healthy export trade so that Canadians can afford imported goods. Wheat has been the traditional agricultural export of the Prairies, but in addition, the region exports significant quantities of barley, canola (rapeseed), and cattle, as well as lesser-known products such as honey, dehydrated alfalfa, and breeding livestock and genetic materials such as frozen cattle embryos. In 1985, for example, wheat and wheat flour exports from the province totalled $832 million; barley $123 million; other cereals and cereal products $42 million; canola $204 million; livestock and other animal products $296 million.

## Agricultural Processing

Within the province, the presence of a healthy processing industry adds to the stability of the area's economic base. The food and beverage industry is the largest manufacturing industry in the province, accounting for more than one-quarter of the total value of manufacturing shipments from the province. It is also the largest manufacturing employer in the province, employing about one-fifth of all manufacturing employees.

The meat and poultry processing industry is by far the largest sector both in terms of employment and value of sales. In 1983 these firms, ranging from small abattoirs to modern multi-million dollar high-volume facilities, shipped $1.959 billion worth of meat and poultry products. Dairy products come second with total shipments excluding fluid milk of $245.3 million in 1983. The beverage industry, which includes soft drink manufacturers, distilleries, breweries and wineries has grown rapidly in recent years, with 1983 sales of about $295 million, more than 40 per cent higher than 10 years earlier, in real dollars.

Other large areas of processing activity are in grain products ranging from breakfast cereals to cookies ($86 million in 1983), bakery products ($87 million in 1983) and feeds for animals ($273 million in 1983). The trend in food processing has been toward fewer, larger, more efficient establishments generating a greater volume and greater value of production.

# Farm Productivity

Down on the farm as well, the trend has been toward larger operations involving greater investments in land, buildings and equipment. Farm size has steadily increased for several decades, as has the average capital investment in each farm. There has been a corresponding decrease in numbers of farms: in 1951 there were 84,315 farms; by 1981 there were 58,056. Technological advances have been a major factor influencing this trend. Mechanized farming and modern methods such as the use of chemical fertilizers and pesticides have enabled one person to do much more work and produce much more than has ever been possible. At the same time, these machines and materials are very costly and only a large-scale operation makes their purchase feasible. Meanwhile the productivity of each unit has risen substantially, especially in terms of the number of people required to keep a farm unit operating. Currently farmers make up only 2.4 per cent of the province's population. Along with increased farm size there has been a dramatic increase in sales per farm. In 1971, only 3.6 per cent of farms reported sales of $50,000 or more. By 1981 that figure had risen to 29.6 per cent. Even correcting for the large effect of inflation in that decade (one 1981 dollar was worth only 40 cents in 1971 terms) this represents an increase. The category including farms having sales greater than $250,000 comprised 2.9 per cent in 1981.

This increase in farm sales has, of course, meant that a larger amount of money circulates within the Alberta economy — and is particularly noticeable in rural areas — because of farmers' spending on goods and services. For example, in 1985 farmers spent $2.67 billion on goods and services including rent, wages and taxes. They paid out $48 million in taxes and $201 million in wages. They also paid $418 million in interest charges to service the debt on their land, buildings, equipment and other purchases. Agriculture is also a major consumer within the province of one of Alberta's other major resources: farmers spent $298 million on petroleum products and $357 million on fertilizer and lime; a large portion of the fertilizer is nitrogen fertilizer derived as a byproduct of the natural gas industry.

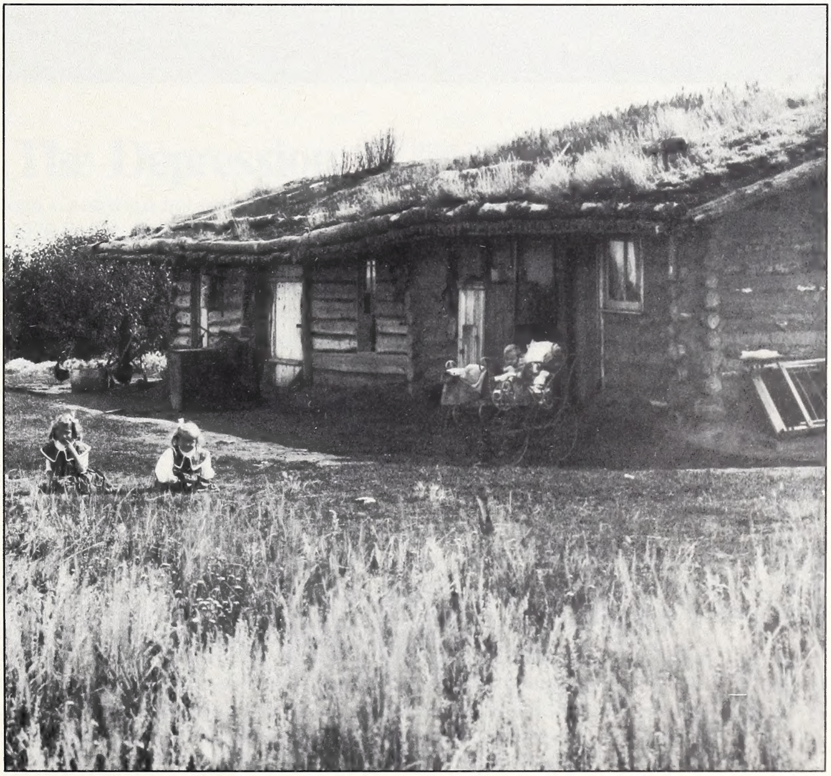
# The History of Agriculture in Alberta

How did agriculture become the industry just described, in such a new land and in such a relatively short time? The first white man to cultivate the soil in what is now Alberta was Peter Pond, a fur trader who established an isolated post near Lake Athabasca. In 1779 he was raising vegetables in his small garden. More than half a century later, in 1857, the explorer Captain John Palliser travelled the southern Prairies and pronounced the land and climate unsuitable for agriculture. Soon after that, settlers began to move into the area and Palliser's contention was disproven.

But it was more than 100 years between Peter Pond's garden and any large-scale attempts at agriculture in what was then the Northwest Territories. Ranchers began to move into the southern areas between 1874 and 1880, mainly from similar country south of the American border. They found abundant grasses and a climate moderated by occasional Chinook winds in the winter, which made year-round grazing possible. Civilization in the form of the Northwest Mounted Police arrived when Fort Macleod was established in 1874. Surveyors had been working since 1871 on the mammoth task of dividing the Prairies into a grid system of townships (six miles by six miles), sections (one mile square) and quarter sections, in preparation for the allotment of the unbroken prairie to homesteaders.

*A rancher's home near Vegreville, 1904. Between 1901 and 1905, 40,000 homesteaders were given free hold title to their land in exchange for paying $10, agreeing to stay on this land for at least three years, breaking a certain amount of land each year and building a house.*

Provincial Archives of Alberta: Brown Collection B2645



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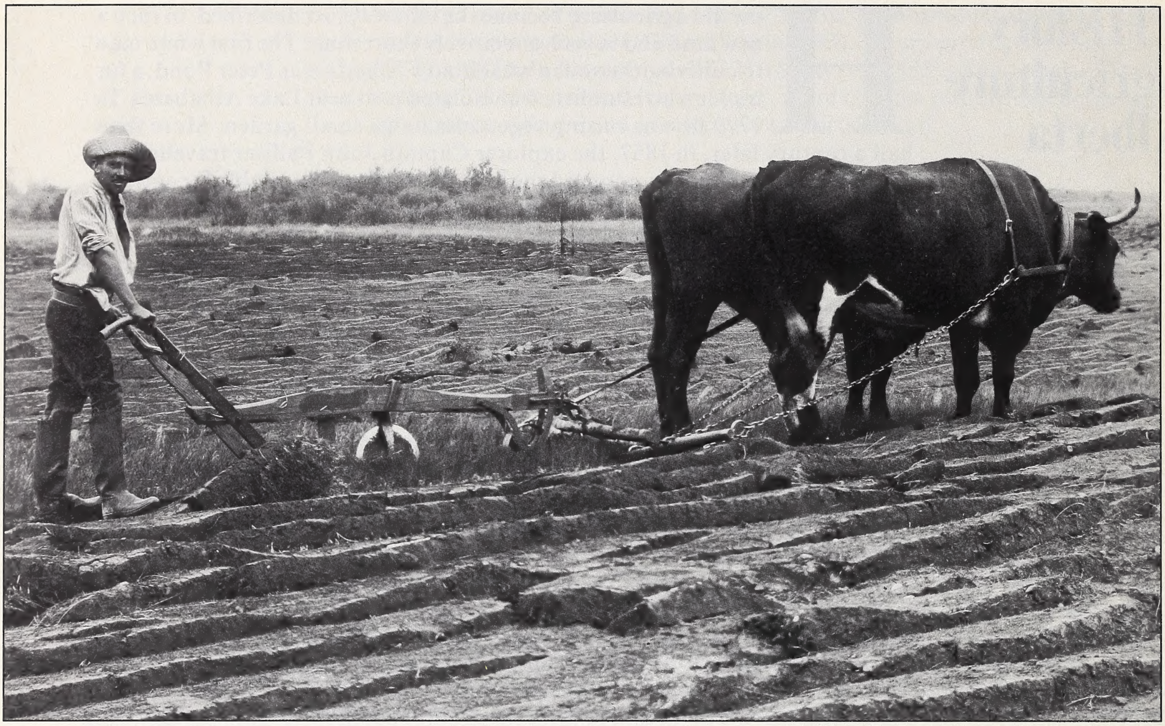


*A homesteader breaking prairie near Lloydminister, about 1900.*

## Settlement

It was not until the Canadian Pacific Railway reached the area in 1883 that settlement of any consequence began. By the 1890s a tide of immigration into the West was underway, peaking just prior to the outbreak of the First World War. Between 1901 and 1905, 40,000 homesteads were granted in what in 1905 became the province of Alberta. Homesteaders were given freehold title to their land in exchange for paying $10, agreeing to stay on the land at least three years, breaking a certain amount of land each year and building a house. The settlers came mainly from Europe (especially northern, central and eastern Europe and the British Isles). Some also moved from the eastern provinces and northward from the United States, where virtually all good potential farmland had already been opened up by settlers.

The early homesteaders relied on wheat as their main crop. In 1907 a new breed of early-maturing wheat, Marquis, was developed to replace the later-maturing Red Fife. Even so, drought, frosts, diseases and pests frequently caused crop failures. Farmers discovered they were better off diversifying, and mixed farms raising dairy cows, hogs and poultry as well as field crops became common. Animal populations on farms tended to fluctuate, rising when grain prices were low.

Although farming communities on the Prairies were in their formative stages, some of the mechanical revolution that was so quickly and profoundly changing the Western World was being felt in Alberta. Huge, clumsy steam tractors pulling multiple-bladed ploughs had broken some of the Prairie land starting about the turn of the century. Steam threshers, owned by custom operators and moved from farm to farm, saw their greatest use in the first two decades of the century.

By the time the 1920s arrived, general optimism about agriculture reigned. What had been the new frontier just a few short years earlier was rapidly developing into a productive agricultural area. The first irrigation projects in southern Alberta had been completed early in the century, and by the 1920s irrigation was widespread. Mechanization of farming was taking hold. The increased demand for food and the manpower shortage caused by the First World War, combined with the availability of new, lighter gasoline tractors, brought the steam era to a close and gave mechanized draft power a permanent place. Farmers were rapidly adopting automobiles for their personal transportation. The earliest recognizable versions of modern implements were appearing on farm fields. Immigration was still filling up the areas not yet cleared and broken. Farmers had formed their own co-operative organizations for marketing their grain, and were such a potent force politically in an area with a predominantly rural population that they formed a political party which ran the provincial government in the 1920s.

## The Depression

But then came what is still known on the Prairies as the "Dirty Thirties". The Western Canadian economy was hit by the general Depression that followed the 1929 stock market collapse, by the resulting low commodity prices, and by a drought that caused crop failure after crop failure. Summerfallowing, the practice of letting land lie fallow for a summer and cultivating to control weeds, had been introduced in the 1880s to conserve moisture. The dry, improperly tilled soils drifted badly. Grasshopper plagues were common. Many farmers were forced off the land, to join thousands of other destitute people across the continent.

One result of the drought was the development of improved methods of soil conservation — strip farming, the planting of shelterbelts to break the wind's force, and new methods of cultivation conserving a protective layer of plant material on the surface of the soil.

As the 1930s drew to a close, the drought ended and the Second World War broke out, restoring prosperity to Alberta farms. Once again, farm products were in demand, especially livestock. Bacon was an especially popular item and the swine industry expanded dramatically.

*Since the war, farming has become more specialized, farm units larger and the investment required correspondingly greater.*

## The Modern Era

The process of mechanization resumed full-tilt with the labor shortage, strong demand and vastly increased industrial capability that accompanied the war. The tractor replaced the horse forever and the threshing crew gave way to the swather and combine, which could reduce harvesting to a two-person operation. Government funding was applied to the expansion of irrigation in the South. Locally-based organizations, which had begun springing up throughout rural Alberta during the 1930s, continued to install telephones in rural homes. Similar farmer-owned companies were spreading a network of electrical power lines. After the war one-room schoolhouses were slowly replaced with modern centralized schools to which students were transported by schoolbus.

Since the war, farming has become more specialized, farm units larger and the investment required correspondingly greater. A single piece of farm equipment such as a combine today can cost more than $100,000 while such other necessary farm inputs as fertilizer, weed control chemicals and fuels can add thousands of dollars to a farmer's bills. Farmers tend to be better educated than their homesteading forebears, often with specialized agricultural education from one of the province's three agricultural colleges or the Faculty of Agriculture at the University of Alberta. Such "high technology" innovations as automated feeding systems, embryo transplantation in livestock, electronic monitoring devices on farm equipment, and micro-computers are also finding their way gradually onto the farms. Farm families are no longer isolated. The automobile, telephone, radio, television and now the satellite dish have ensured that farmers have access to education, health care, communications, consumer goods and services at a level comparable to city dwellers.

# The Land Base

Although the people and the farms they have built have made agriculture into the modern, efficient industry it is today, the amazing advances of the past century would not have been possible without a good basis with which to work: the land itself. About 30 per cent of Alberta's total land area is used in crop and livestock production. The 50 million acres used for agricultural production consist of approximately 31 million acres of improved land and 19 million acres of unimproved land. Although improved farm land comprises only 20 per cent of the province's total land area, it represents more than one-quarter of all of Canada's improved land acreage.

The majority of the improved acreage is used for the production of field crops: cereal grains, oilseeds, forage crops and others. The remainder is either improved pasture (pasture which has been seeded with tame grass, fertilized, drained or otherwise enhanced) or summerfallow. The unimproved land in the province is the basic resource for an extensive cattle industry. The native growth, with careful management, is capable of supporting cattle herds indefinitely.

## Soil Zones

The province of Alberta is divided into five major soil zones, Brown, Dark Brown, Black, Dark Gray and Gray. The Black soil zone lies in a narrow, north-south belt from Edmonton to Calgary and along the foothills to the Montana border. These soils constitute only 16 per cent of all soils in Alberta. However, because of favorable moisture conditions and high organic matter, they account for one-third of the land used for agriculture in the province.

South and east of this band lie the Dark Brown and Brown soil zones. Moisture is a major limiting factor to crop growth in both zones. Each of these constitutes about one-tenth of Alberta's soils but account for up to 40 per cent of the land base in Alberta used for agriculture.

The Dark Gray soils lie north and west of the Black soil zone and are also present in the Peace River block. A cool climate results in a limited growing season for annual crops. These soils make up 10 per cent of the province's total soils but comprise a larger percentage of agricultural land. By far the largest area is covered by Gray Wooded soils (52 per cent), although these soils support less than one-tenth of all agricultural activities. They cover almost the entire northern and west-central portion of the province. Most Gray Wooded soils are severely limited by a short growing season.

Another method of classifying soils, the Canada Land Inventory system, provides a rating of the agricultural production capability in terms of climate, soil and/or landscape limitations and the degree of those limitations. The first four of seven classes are considered arable (capable of producing cultivated crops), although Class 4 is marginal. Classes 1 to 3 constitute 17 per cent of the province's soils. Adding Class 4 land, a total of 32 per cent of the province is capable of producing cultivated crops. CLI Class 5 lands, accounting for 17 per cent, are capable of improved forage crop production.

## Production Capability of the Agricultural Land Base

The agricultural land base is finite and care needs to be taken to protect and conserve it. The increase in Alberta's population since the 1960's led to the conversion of agricultural land to urban and industrial uses. This has reduced the number of acres of prime agricultural land available for production. Degradation by wind and water erosion and by salinization have also contributed to a concern for the agricultural land base. Efforts are being made to counteract and rehabilitate affected areas through soil conservation practices. Reclamation of land disturbed by oil and gas well sites, pipelines and coal mines is also required.

The productivity of many agricultural lands can be significantly increased through more intensive land management and advanced technology. Examples include: drainage, liming acid soils, range improvement and irrigation. The potential also exists for opening new lands into the frontier areas of the province. These lands, however, are predominantly Canada Land Inventory Class 4 with lower capability for cultivated crop production. The potential to increase production through intensification and expansion of the agricultural land base do, however, provide a secure future for the agricultural industry in Alberta.

## Irrigation

Irrigation is one of the primary methods of improving agricultural productivity. Irrigation is continuing to expand beyond the 1.1 million acres currently serviced by the 13 irrigation districts in southern Alberta. Today, crops produced under irrigation account for about 12 per cent of Alberta's agricultural production, even though irrigated land constitutes only four per cent of the total cultivated acreage. Irrigation enables the growing of crops such as sugar beets and soft spring wheat which could not survive on the amount of moisture available on Alberta's dryland farms; it also greatly increases yields over what could be expected without the additional moisture.

*Today, crops produced under irrigation account for about 12 per cent of Alberta's agricultural production, even though irrigated land constitutes only four per cent of the total cultivated acreage.*

*Agricultural soils are too valuable to let this happen again. Today's farmers can't afford to let up on the use of conservation management practices.*

Provincial Archives of Alberta: Photograph A5672

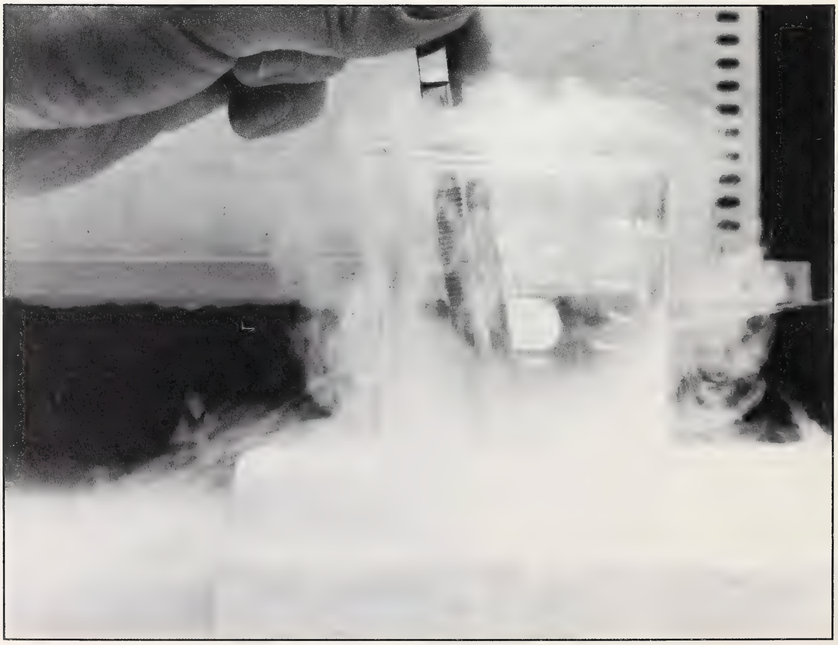
## Conservation

In recent years there has also been a reawakening of concern, reminiscent of the conservation advances of the 1930s, for preserving the quality of the soil. Old conservation management practices are being encouraged and the traditional farming methods such as summerfallowing are being re-examined. It is now known that the practice of summerfallowing may cause a net loss in fertility, organic matter content and soil quality, and that in all but the driest areas of the province the moisture saved is not enough to outweigh the harmful effects of the practice. Because of the importance of organic matter content in maintaining the soil's tilth, fertility and resistance to erosion, new methods emphasize maintaining or building up the organic matter, which has accumulated in the soil over thousands of years but which can be depleted rapidly with improper practices. Other conservation efforts are aimed at controlling the spread of salinity, which may result from improper cropping practices, including summerfallowing, and which can reduce crop yields on previously fertile soil. A third area of emphasis is on the prevention of wind and water erosion. Most of the erosion can be controlled by maintaining an adequate amount of protective crop residue cover. As the years go by, more is also being learned about how to make the most out of the fragile and often not very fertile soils of the Gray Wooded zone. Emphasis here is on the development of crops and crop rotations that maintain or improve the fertility of the soil while providing adequate income to the farmer.

# Agricultural Research

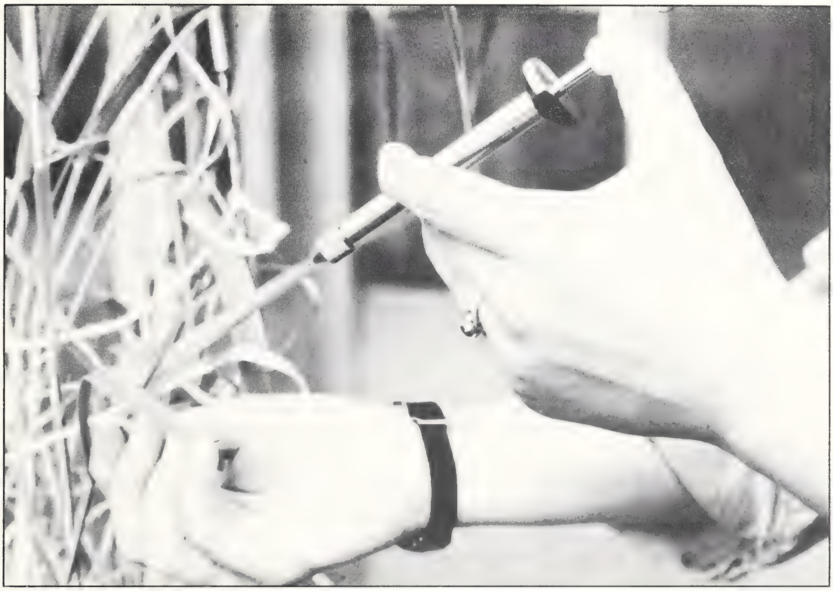
The search for improved understanding of physical and biological processes, for better varieties of crops and breeds of livestock, and for improved methods of producing and processing agricultural products, is an international undertaking. Alberta's agriculture industry has benefitted from the advances made elsewhere, but it has also contributed to the advancement of agricultural research through activities conducted here.

The great majority of agricultural research in the province is conducted by public institutions and financed by public monies, largely from federal and provincial governments. In recent years, however, there has been more activity in the private sector, often supported in part by public funds. Agriculture Canada, the Canadian government's agriculture ministry, maintains research facilities in Alberta at Lethbridge, Lacombe, Beaverlodge and Fort Vermilion. The provincial government supports research at various locations: field crops research at Lacombe, special crops and horticultural research at Brooks, environmental studies at Vegreville, irrigation and special crops research at Lethbridge and food processing research at Leduc. In addition, the provincial government provides funds for projects conducted at other institutions and in the private sector. The third major institution conducting agricultural research is the University of Alberta in Edmonton. The Alberta Research Council, a provincial government body carrying out research in a wide variety of areas in advanced science and technology, also undertakes some projects of value to agriculture. The three colleges of agriculture at Vermilion, Fairview and Olds also do some applied research and demonstrations, although these institutions are primarily devoted to agricultural education.



*Agriculture thrives on innovation.*

*It would be difficult to create and maintain a diversified and stable agricultural economy without agricultural research.*



Although the province has been able to adopt many innovations made elsewhere, it has often been necessary to tailor those advances to Alberta conditions. Occasionally a problem arises for which the needed research simply isn't available elsewhere. Scientists on the Canadian Prairies have combined their efforts to produce new varieties of crops with characteristics needed by Prairie farmers: early maturation, frost and drought tolerance, disease and pest resistance. A spectacular example was the development of the crop now known as canola, virtually a new species in terms of its potential uses and the feasibility of production on the Prairies. Canola varieties were developed by removing two naturally occurring chemicals from rapeseed. Canola is now a major oilseed crop in Canada, especially on the Prairies.

A second example of tailoring an existing life form to meet the particular needs of the province has been the development of the Alberta Bee, a hardy strain suited to foraging for honey under the cool conditions of northern Alberta and able to survive the winters. New livestock breeds have also been developed in Alberta. The Lacombe pig, a white breed with good carcass and growth characteristics, was bred at the Agriculture Canada research station in the central Alberta town after which the breed was named. The large variety of genetic stock in Alberta beef cattle has stimulated research on crossbreeding, the results of which are often economically advantageous because of the vigorous performance of genetically mixed stock.

Soil scientists in the province have devoted considerable energy to understanding the characteristics of and improving the productivity of the Gray Wooded soils which make up much of the province's land, especially uncultivated land still available for expansion of agriculture. Gray Wooded soils tend to be poor in texture and fertility and must be managed carefully if agricultural production from those soils is to be economically feasible.

# PART 2: AGRICULTURAL PRODUCTION IN ALBERTA

## Cereals and Oilseeds

### Wheat

With only about five per cent of world production, Canada accounts for 17 to 22 per cent of world trade in wheat and flour. In Alberta, wheat accounts for 20 to 25 per cent of farmers' annual cash receipts and occupies one-third of the cultivated farm land. In 1985 Alberta farmers produced 4.84 million tonnes of wheat worth about $700 million dollars.

Wheat is fairly drought-tolerant, will grow on a wide range of soil types, and responds well to fertilizer. Plant breeding has produced varieties with reduced days to maturity and improved resistance to diseases, pests, lodging (in which the stems buckle because of wind or rain and the grain lies flat) and shattering (loss of kernels from ripe heads).

Because wheat has a longer growing period and a higher minimum heat requirement than most other small grains, it is more suited to the southern areas of the province, although the very long summer days of northern Alberta enable wheat to mature in areas having less than the 110 frost-free days usually considered minimum. In southern Alberta drought in the spring and hot weather in the summer can sometimes limit yields. There are a number of different classes of wheat which grow well in different parts of the province.

— Hard red spring wheat has the widest distribution throughout the province because of the early-maturing varieties that have been developed, although the largest portion and best grades are grown in the south-central regions in the Dark Brown and Brown soil zones. It is the high quality bread wheat on which the Canadian Prairies' wheat growing reputation is based.

— Hard red winter wheat, grown mainly in the chinook belt in the southwest part of the province, requires milder winters because it is planted in the fall, but it is able to take advantage of early spring moisture and yields 10 to 15 per cent more than spring wheat. Improved management techniques used to increase winter survival are allowing winter wheat production to spread north and east. It is used mainly for cookies, biscuits and pastry flour, but new varieties and changing baking technology have enabled increased usage in bread making.

— Durum wheat, used mainly for pasta, is grown almost exclusively in southern Alberta where the growing season is long enough. Alberta Durum wheats make the highest quality pasta in the world.

— Soft white spring wheat, with higher yield potential and lower protein content than the others, is generally grown in the irrigated southern regions of Alberta. It is used mainly for livestock feed and pastry flour.

Prairie wheat is sold to export customers exclusively by the Canadian Wheat Board, a federal government agency. The Wheat Board also controls deliveries through quotas in an effort to match deliveries to demand, and establishes a pooled price so that all farmers producing a particular type of wheat receive the same price per unit regardless of the time of year sold. Grain is delivered by farmers to the country elevators that dot the Prairie landscape. The wheat is graded at the elevators and then shipped by rail to a port on the east or west coast or on the Great Lakes waterways system, from which it is exported. Most of Alberta's grain for export goes to the west coast.

Wheat

**Barley**

*About half of the barley produced in Alberta is fed to livestock.*

# Barley

Barley is second to wheat in terms of acreage and cash receipts in Alberta (about 15 per cent of total crop receipts). About half of the barley produced in Alberta is fed to livestock as grain, silage, or high-moisture grain. A significant portion of it is fed on the farm where it was grown. The second major use for barley is malting. Outside of North America virtually all barley used for beer is two-row (two rows of kernels on each head). Within North America both six-row and two-row varieties are purchased for malt. Alberta barley is known around the world for its excellent malting quality. Maltsters have stringent standards: they want grain low in protein, high in carbohydrates, with good germination and free of damage and imperfections.

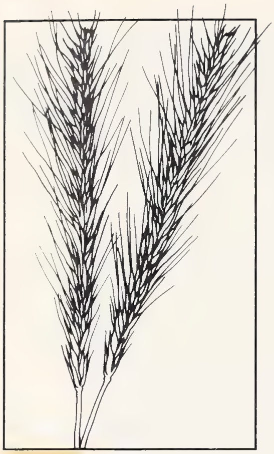
Barley has a short growing season and can therefore be grown throughout the province. It is more tolerant of salinity than other cereals but more sensitive to acidity; it also uses less moisture than the other coarse grains (oats and rye). Of all the small grains, barley is the most responsive to soil fertility and good management.

Barley can either be marketed as a cash crop to livestock feeders, fed on the farm where it was grown, sold to maltsters, or marketed through the elevator system to the Canadian Wheat Board. Alberta sells feed barley to other provinces, particularly British Columbia. It is an important export grain, second only to wheat. Canada is the leading world exporter, selling 2.2 million tonnes in 1985. Alberta barley production in 1985 totalled 4.77 million tonnes; farm cash receipts from this production amounted to $270 million.

**Oats**

# Oats

Oats play a minor role as a cash crop in Alberta but are an important feed grain. In 1985 Alberta produced 972,000 tonnes of oats for grain. Alberta produces about one-third of the oats grown in Canada; 80 to 90 per cent is fed to livestock. A small amount is used for human consumption, mainly as rolled oats and oatmeal. Oats will tolerate many different kinds of soil, including acid and poorly drained soils. However, they require more moisture than other small grains and are prone to heat damage and lodging. They do best in the cool, moist climate of west-central Alberta and parts of the Peace River region.



Rye

## Rye

Although rye is a minor crop in Alberta, it comprises about one-quarter of the rye grown on the Prairies. In 1985, Alberta farmers grew 124,400 tonnes of rye, accounting for 0.1 per cent of Alberta farm cash receipts. Most of the rye grown in Alberta is the fall-planted type, grown mainly in southern Alberta where it is often used as pasture for livestock in the early spring and late fall; it also protects the land from wind erosion during the winter. Rye can produce adequate yields even on very poor soil; it is more resistant to winterkill than winter wheat. Rye as a grain is used in Alberta mainly for animal feed; other uses are bread flour and whiskey. About half of Alberta rye production is exported. It is not marketed by the Canadian Wheat Board and most is sold on the open market, prices being established at the Winnipeg Commodity Exchange. A major drawback of rye is its susceptibility to ergot, a fungal disease, which is poisonous to human beings and animals.

## Canola

The important Prairie crop that is now known as canola was not even grown on the Prairies until 1943. "Rapeseed", as the forerunner to today's canola was called, was then used as a lubricant for warship engines. The early rapeseed varieties contained two compounds, erucic acid and glucosinolates, which reduced their suitability for human and animal consumption. Canadian plant breeders subsequently developed new varieties low in both of these compounds; because of this important change in the plant's characteristics the name was changed to canola.

Today canola is considered the third ranked crop in terms of value of production in Alberta; some years it comes second to wheat as a source of cash receipts from crops, accounting for $341 million or almost 9 per cent in 1985, when 1.25 million tonnes were produced. It is now used primarily as an oil for human consumption. More than one-third of the margarine, almost half of the shortening and three-quarters of the salad oil manufactured in Canada is made from canola. In addition, the seed and oil are important export commodities. The meal, a byproduct of the oil crushing process, is used as a protein supplement in livestock rations, particularly for poultry, swine and dairy cattle.

Canola production is most suited to medium textured soils such as loams, clay-loams and silty clay loams because they have good water holding capacity, allow moisture infiltration and have adequate drainage. Most agricultural soils in Alberta fall within these textural classes. In Alberta, the main canola growing areas are the Parkland belt of central Alberta and the Peace River region. Two species of canola are grown in Alberta. *Brassica napus* (Argentine type) varieties are later maturing and more suitable to the longer growing season areas, while *Brassica campestris* (Polish type) varieties are earlier maturing and can be grown in all areas. Canola is a poor weed competitor in the seedling stage and is subject to many diseases and insect pests. Proper management of the crop is essential to obtain high yields.

Alberta produces 40 per cent of the total Canadian canola crop. Most of Alberta's canola is exported through the West Coast ports; Canada exports about one-half of its crop — making it the number one exporter of canola in the world.

Canola

Flax

## Flax

Over the years Alberta's share of Canadian flaxseed production has declined, from about 20 per cent two decades ago, to three per cent in 1985. Flaxseed acreage in 1985 was 80,000 acres. Flax is grown either for oil or fibre; oilseed flax is the type grown in Alberta. Linseed oil extracted from the flax is used in protective coatings for wood. The flax grown in Alberta has a reputation for yielding very high quality linseed oil which dries quickly, a trait of flax grown in a cool climate.

Flax does well in areas suitable for wheat as it requires a similar frost-free season. Flax can also be grown in the Peace River region because the long days hasten maturity. Flax grows best on heavy loam soils that retain moisture well for the plant's limited root system. In the past, poor flax yields were generally the result of drought and weed competition. Today, most broadleaf and grassy weeds including volunteer cereals can be controlled in flax with herbicides. Most of the flax grown in Canada is exported; Canada is the world's leading exporter although it has only 18 per cent of world production.

## Special Crops

Even though the six major cereals and oilseeds listed above (wheat, barley, oats, canola, rye and flax) provide Alberta farmers with the majority of their crop revenue, other small-volume crops play an important role in the farm economy. They are mainly grown to sell off the farm rather than to be fed to animals on the farm, and because they are usually grown under contract, the farmer can decide whether to plant based on the assurance that the crop will be sold once it is harvested, at a price known in advance. In irrigation areas, these crops are often needed to round out the four or five year rotation used in that area to preserve soils and prevent pest and disease build-up.

Although production of special crops is often risky and requires sophisticated management skills, the potential profits are high. Production is usually limited to certain areas where the soil and climate is suitable, or where a contracting company or processing plant is nearby. Because the production of these crops depends on a number of factors that can vary greatly, acreage of any species tends to fluctuate widely from year to year.

Among the cereal grains, the largest volume special crop is corn. Grain corn production, averaging about 30,000 tonnes a year from 12,000 acres, is limited to the southeastern irrigated region around Bow Island where the climate is warm enough for corn production. About 400,000 tonnes of silage corn is also grown on about 25,000 acres in southern Alberta, and a further 3,000 acres of sweet corn for human consumption comes from the Taber area. Triticale, a hybrid of wheat and rye, is grown on an average of 8,000 acres in Alberta. Most is sold for flour, but some stays in the local market as feed. A third cereal produced in small quantities under contract is buckwheat, an early maturing crop that can be grown in central Alberta. Most is exported to Japan.

Safflower

Pulse crops (legumes grown for their edible seeds) have been gradually becoming established. An excellent source of vegetable protein, they are grown primarily for export as human food but are also used here for animal feed as grain or silage. They improve soil quality and lessen the need for chemical fertilizer because they can "fix" nitrogen from the air. Field peas are the largest volume pulse crop produced, averaging a fairly stable 20,000 acres of dry peas (both green and yellow) and 4,000 for processing. The suitability of peas to Alberta growing conditions, and their nutritional characteristics, make them the legume with the greatest potential to replace imported soybeans as a protein source in feed. The longest established pulse crop in the province is field beans, produced in the irrigation areas since the 1920s and processed at a plant in southern Alberta. Several different varieties comprising about 8,000 acres are grown, mainly for export as human food. Fababeans and lentils are also grown in smaller quantities in the south, mainly for export as food. Fababeans are also grown for silage farther north. Lentils are a dryland crop best suited to Dark Brown soils.

*The suitability of peas to Alberta growing conditions and their nutritional characteristics, make them the legume with the greatest potential to replace imported soybeans as a protein source in feed.*

*Canada is by far the world's largest exporter of mustard.*

The most popular of the special crops is mustard, with a relatively stable acreage of about 50,000 a year, worth about $7 million in cash receipts to farmers. Canada is by far the world's largest exporter of mustard, the main markets being the United States for yellow mustard, Europe for brown mustard and Japan for the Oriental type. About equal quantities of yellow and Oriental mustard are grown in Alberta, and a smaller amount of the brown. Maturing in just over 90 days, mustard can be grown farther north than many special crops.

Sunflower and safflower, two oilseeds producing high quality vegetable oils, are grown on about 2,500 acres each. Sunflowers have been grown in southern Alberta for many years, although the closure of an oil crushing plant resulted in dwindling acreage of oil sunflowers. Most of the acreage is now of the confectionery sunflower type. Safflower is in the early stages of development as a crop in Alberta. The first Canadian cultivar, used for bird seed, was licensed in 1985. Safflower is of particular interest to southern Alberta growers because of its potential to control soil salinity with its long tap roots which draw water from deep in the soil.

Canaryseed, used for exactly what the name implies, is grown under contract in widely varying quantities, averaging about 5,000 acres a year. It can be grown in about the same areas, and by about the same methods, as hard red spring wheat. The majority is exported.

Sugar beets have been grown in southern Alberta ever since irrigation began, and the area has traditionally supplied Alberta and part of Saskatchewan with sugar. In recent years, producers have been hard-pressed to obtain adequate returns in a competitive world market with cheap cane sugar, but the crop still comprises 30,000 or more acres or about three per cent of irrigated acreage. What was once a labor intensive cropping operation employing many seasonal workers is now highly mechanized. Sugar beet production requires a large investment in equipment and inputs such as fertilizer, and requires skillful management. A factory at Taber processes the Alberta beets.

# Forage Crops

The size of the ruminant livestock industry in Alberta makes forages among the most important crops in the province. In 1985 the beef, dairy and sheep sectors contributed 37.9 per cent of farm cash receipts, or $1.466 billion. Forages constitute 70 to 80 per cent of ruminant rations, including both stored feed and grazing. In Alberta improved pasture occupies about 12 per cent (3.9 million acres) of cultivated farm land; in 1985 production of tame hay was 4.63 million tonnes while processed alfalfa production was 229,000 tonnes, and fodder corn production, 390,000 tonnes.

Forage crops include annual and perennial legumes and grasses. Legumes, which have thick tap roots that penetrate deeply into the soil, produce a high protein feed and add nitrogen to the soil, thereby increasing the soil's fertility. For that reason they are an excellent addition to a crop rotation, especially on the less fertile Gray Wooded soils. Legume species grown in Alberta include alfalfa, red clover, alsike clover, sweet-clover, bird's-foot trefoil, cicer milk-vetch, sainfoin and crown vetch. Alfalfa is grown extensively on irrigated lands in southern Alberta, where the added water produces large volumes of forage, yielding up to three harvests or "cuttings" during the growing season. An alfalfa/bromegrass mixture is the most commonly grown tame hay crop in the Black soil zone of central Alberta, where the soil and climate support a large livestock population and the province's largest concentration of tame hay.

Grass species most used include bromegrass, crested wheat grass, timothy and creeping red fescue. Grasses have fibrous roots which add to the organic content of the soil and prevent wind and water erosion. Grasses often withstand extreme climatic and soil conditions and are long-lived. Seeded pastures typically contain at least half grass, a combination that reduces the bloating problems in livestock commonly associated with a legume-rich unprocessed feed. Bromegrass and orchardgrass are common in irrigated lands, especially in combination with alfalfa. In the Brown soil zone of southeastern Alberta drought-resistant species such as crested wheat grass and the wild ryes are used, especially in combination with alfalfa. In the Gray Wooded soil zone grasses such as timothy, brome and creeping red fescue are used in combination with the legumes alfalfa, alsike and red clover.

*Several processing plants in Alberta now dehydrate alfalfa and form it into pellets.*

*Large round bales have replaced small square bales in most haying operations.*

Baling of sun-cured hay is still the most common method of preserving forage crops. Large round bales have replaced small square bales in most haying operations. Silage is increasingly popular with beef cattle producers, and has been a mainstay of the dairy industry for many years. Silage uses forage of higher moisture content and preserves it in a fermenting process. Several processing plants in Alberta now dehydrate alfalfa and form it into pellets. Slightly less than three-quarters of the 229,000 tonnes produced in 1984-85 was exported.

Native and tame pasture constitutes a major source of ruminant feed, during the summer months. Pastures must be carefully managed so that the livestock does not damage the forage stand by over-grazing. Annual pasture is commonly planted, especially for spring and fall grazing, in areas where the perennial pastures are rested at those times of the year and where cultivated fields would be prone to erosion. Fall rye and winter wheat are popular annual pasture.

A specialized form of forage crop production is the growing of pedigreed forage seed. Alberta farmers produce over half of Canada's alfalfa, alsike clover, red clover, crested wheat grass, creeping red fescue and pubescent wheat grass seed supplies. Seed production is concentrated in the Peace River region. In 1985 Alberta farmers produced 10.04 million kilograms of forage seed.

# Livestock and Poultry

## Beef Cattle

The heart of Canada's beef industry, Alberta has nearly 40 per cent of the country's beef breeding herd. Close to one-third of Alberta farms are strictly beef operations while another one-tenth raise beef in combination with grain or other livestock. The industry accounts for about 30 per cent of farm cash receipts in the province: $1.211 billion in 1985.

The popular image of Alberta's beef industry is one of sprawling ranches in the foothills of southern Alberta. Although that is where beef production began in Alberta more than a century ago, it has since spread throughout the province. The raising of cows and calves in particular, once concentrated in the ranching areas, has increased more rapidly in central and northern Alberta. The cattle feeding industry, which takes weaned calves and raises them to market weight, has shifted toward south-central and southern Alberta. This shift has occurred primarily because the major markets for finished cattle are located in Calgary and Lethbridge.

Of those Alberta farms that raise cattle, one-third have fewer than 33 head. This is a continuation of the production system developed in past years where farmers who relied primarily on grain for their income fed cattle in order to maintain farm income through periods of low grain prices, poor grain markets, and natural disasters such as frost and hail. The cattle also made use of land that was too poor to cultivate but could be used for grazing. Over the past two decades, however, more operations have developed that rely heavily or entirely on livestock for their income. Many commercial feedlots have also sprung up, purchasing their feed and feeder cattle or custom-feeding someone else's cattle for a fee. These highly mechanized high-volume operations will probably account for the major portion of slaughter cattle production in the future.

*The most important single resource needed for beef production is a land base suited to growing forage and feed grains. Alberta has such a land base.*

The most important single resource needed for beef production is a land base suited to growing forage and feed grains. Alberta has such a land base, especially in its Black, Dark Gray and Gray Wooded soil zones. Even though significant expansion has taken place in the Gray Wooded zone during the past 20 years, there is still a potential for a considerable increase in Alberta's beef production. Whether this will occur depends on general economic conditions for farmers, world demand for grains as food, and the ability of Alberta beef producers to gain access to other markets, especially in the western United States and Pacific Rim countries. Currently, Alberta exports about eight per cent of its beef. About 40 per cent goes to the Quebec market, 25 per cent remains in Alberta, and the rest goes to other Canadian provinces. Meat processing is a large industry in Alberta, with more people employed in livestock and poultry processing than in any other segment of the food and beverage industry. Besides beef, cattle provide many byproducts ranging from hides and feed components to pharmaceutical products such as insulin.

A specialized part of the beef industry is the production of pedigreed or purebred breeding stock. Over the past 20 years Alberta breeders have assembled the largest and most varied genetic pool of beef breeding stock to be found anywhere in the world. There is a strong demand for Alberta breeding stock and genetic material such as semen and embryos. The breeding industry until a generation ago relied almost exclusively on three British breeds: Herefords, Aberdeen Angus and Shorthorns. The past 20 years have seen the successful addition of breeds from continental Europe: Charolais, Limousin, Maine-Anjou and Blonde d'Aquitaine from France; Simmental from Switzerland; Gelbvieh from Germany; Pinzgauer from Austria; Chianina, Romagnola and Marchigiana from Italy.

## Dairy Cattle

There are about 150,000 dairy cows on farms in Alberta, mainly in the 1,500 commercial herds, producing fluid and industrial milk. The average commercial dairy operation involves an investment of over $600,000. Milk production in Alberta contributes between six and seven per cent to farm cash receipts and amounted to over $250 million in 1985; the sale of dairy cattle added another $25 million to farm cash receipts.

Dairy production, as other types of farming, has become highly specialized and mechanized. Quality standards are very high, with rigid inspection programs covering every phase from the health of the cow through to the finished product at the dairy. Most dairy herds in Alberta are comprised of Holsteins, known for their high milk production. With modern management methods, performance testing and rigorous breeding standards, average production has increased dramatically. Over half of Alberta's dairy cattle are now produced through artificial insemination and today, an average cow produces about 6000 litres of milk a year. Other dairy breeds in the province include Ayrshire, Brown Swiss, Guernsey and Jersey.

About 45 per cent of Alberta's milk is sold for fluid consumption, and commands the highest price. More than half of milk and cream production is sold for the manufacture of other dairy products such as butter, cottage cheese, ice cream, yogurt and cheese. More than 20 kinds of cheese are made in cheese factories throughout the province; the most popular type is cheddar.

Most of Alberta's dairy production is concentrated between the major urban centres of Edmonton and Calgary in the Black and Gray Wooded soil zones. Significant development has also occurred in recent years in the southern irrigation area where there is an abundance of high quality feed. Fluid milk quotas insure that there is an adequate supply of fresh milk produced throughout the year. Nationally, the dairy industry is "supply managed" through a marketing plan that regulates supplies and establishes prices for industrial milk used in the manufacture of dairy products. This marketing scheme has brought stability to the dairy industry in Alberta.

*Today, an average cow produces about 6,000 litres of milk a year.*

## Sheep

Alberta supplies one-third of Canada's annual lamb slaughter. There is one plant at Innisfail that slaughters lamb exclusively and several small abattoirs throughout Alberta slaughter small numbers on a custom basis. The major market for Alberta lamb is for domestic use with moderate amounts being consumed in Ontario.

Soil and climatic conditions in Alberta favor sheep production; sheep are especially suited to grazing on poorer land and consuming lower quality feeds. Approximately 55 per cent of the sheep production in Alberta occurs in southern Alberta (south of Innisfail/Coronation) where an abundance of native rangeland exists. Elsewhere, production occurs in the central and Peace River regions. Most Alberta sheep producers keep their sheep on range, although there are some semi-confinement systems which use feedlots in winter and pasture in summer. Alberta sheep are mainly of the meat producing type, as the market and prices for wool are not attractive. The most popular breeds are Suffolk and Rambouillet.

## Swine

The 7,000 pork producers in Alberta raise 1.8 million hogs a year. More than half of the hogs come from the six per cent of producers who produce 1,000 or more market hogs. These farms feature confined housing in climate-controlled barns, highly mechanized operations and a small land base. The hog industry constitutes a major market for Alberta feed barley producers, consuming 15 per cent of the province's barley production.

Hogs contributed 6.5 per cent to farm cash receipts in 1985, at $253 million. Because the major component of hog feed is barley, the principal hog production region corresponds with the best barley producing area: the Black soil zone from just north of Edmonton to just south of Red Deer. The second major region is around Lethbridge. Hog production has slowly declined in the Peace River region, partly because of distance from markets.

Two large federally inspected packers, one in Edmonton and the other in Red Deer, now slaughter hogs, process pork and sell it wholesale. In addition, 70 small abattoirs throughout the province slaughter about five per cent of Alberta hogs, and small numbers are shipped live to be slaughtered out of the province. Since 1969 Alberta pork producers have sold their slaughter hogs exclusively through the Alberta Pork Producers' Marketing Board. The board establishes prices and allocates sales by a daily competitive bidding system.

Alberta has high quality swine breeding stock; access to the province's breeding stock is aided by the Swine Artificial Insemination Centre near Edmonton. The "white" breeds are the most popular in Alberta. Yorkshires make up the largest number followed by Landrace and Lacombes. The latter breed was developed at Lacombe, Alberta, and breeding stock is now being exported to several European and southeast Asian countries as well as the United States and Mexico. There are also smaller numbers of breeds such as Hampshires and Duroc Jerseys.

*The hog industry constitutes a major market for Alberta feed barley producers, consuming 15 per cent of the province's barley production.*

## Poultry

Poultry production has changed radically from the traditional small flock running loose in the farmyard, to a system where a greater percentage of production is produced in large, confined facilities. Consequently, the number of farms with poultry has decreased but production per farm has increased. The average size of an egg-laying operation is approximately 6,000 hens, while chicken producers have an average of 23,000 on a nine-week quota cycle.

Poultry and poultry products in Alberta generate over 3.8 per cent of total farm cash receipts from the sale of about 49 million kilograms of meat and more than 43 million dozen eggs. Unlike red meats, poultry meat consumption has increased in Canada in the past two decades, from 14.8 kilograms per capita in 1963 to 23.6 kilograms in 1984. The main increase has been in the consumption of broiler chickens; as a consequence there has been a one-third increase in the production of chicken between 1973 and 1984.

Most egg layers are Leghorns, white chickens which produce white eggs. Production of eggs is scattered over the entire province, with approximately 50 per cent of the production on Hutterite colonies. There has recently developed a small market for brown eggs. Broiler production is concentrated near Lethbridge, Calgary and Edmonton. Thirteen commercial hatcheries supply the industry.

The production and marketing of eggs, chicken, turkeys and hatching eggs is regulated by marketing boards; Alberta belongs to national marketing agencies for eggs and turkeys. Under this system each province generally supplies its own needs, although egg production in Alberta is insufficient to cover demand and eggs are brought in from Saskatchewan and Manitoba. Because poultry production costs are high there is very little export. However, improved breeding and management have kept production costs low enough that Alberta poultry producers can compete in their own market, with other types of meat and with poultry imports from outside Alberta.

*Production of eggs is scattered over the entire province, with approximately 50 per cent of the production on Hutterite colonies.*

## Horses

During the past two decades the production of horses has become a significant activity in Alberta's agricultural economy. There are more than 160,000 horses in Alberta, about double the number to which they had dropped when mechanization took over the horse's duties in farm work and transportation. Although the horse is still used in ranch country by working cowboys, horses in Alberta are raised overwhelmingly for recreational use.

Because of the early dependence on horses in ranching and agriculture, Alberta has developed a long tradition of producing good horses. The horse breeding industry returns approximately $20 million a year to producers. The production of high quality purebreds is the part of the industry in which there is the most demand, and Alberta raises the largest number of pedigreed horses of any province. About 30 per cent of the horses registered in Canada every year are from Alberta.

By far the most popular breed is the Quarter Horse, the traditional working horse of cattle country, now used mainly as a show and leisure riding horse. About half the Quarter Horses registered in Canada yearly are from Alberta; in 1985 there were 3,853 Alberta registrations. Arabians are the second most popular pleasure breed, with Alberta producing more Arabians than any other province. In the category of racehorses, Alberta breeders produce mainly Thoroughbreds, for flat racing, although Standardbreds are in increasing demand as the sport of harness racing gains popularity. About 1,200 Thoroughbreds are required for Alberta tracks every year. The third major category is the draft horse, now used almost exclusively for show. Belgians are the most common, but Percherons and Clydesdales are also raised.

Although Canadians generally do not eat horsemeat, there is demand for the product in Europe and Japan. Two processing plants in the province annually slaughter 35,000 horses, returning $15 million to producers, almost entirely from exports.

*Alberta has developed a long tradition of producing good horses. The horse breeding industry returns approximately $20 million a year to producers.*

# Horticulture

## Vegetables

Although vegetable production has grown modestly in recent years Alberta is, by a large margin, a net importer of horticultural products except for potatoes and mushrooms. Enough potatoes are grown in the province to meet much of Alberta's annual consumption requirements. Alberta carrots account for about 30 per cent of total provincial consumption; cucumbers, about 30 per cent and hothouse tomatoes, about half.

In 1985 vegetables and vegetable products worth $6.4 million were exported from the province. Among the commodities exported were seed potatoes, seed and processed peas. Vegetable production in the province, however, has been limited by high labor costs, lack of mechanization, inadequate grading and storage facilities which are very costly, and competition from cheaper American and Mexican imports.

The southern portion of the province is a prime site for production of warm season vegetables because of the high summer temperatures and long growing season. Irrigation is necessary. The central Alberta area in the Black soil zone is better suited for the production of cool season crops such as potatoes, carrots and cabbages, but some irrigation is desirable. Some areas of the Peace River region, particularly river valleys protected from frosts, are good for cool season crops such as cabbage and carrots because of the long summer days and micro-climatic conditions.

The Alberta potato industry generates farm receipts worth about $25 million. More than 200 farmers plant over 20,000 acres producing 200,000 tonnes or more. Half of the crop is used by the province's five processing plants for such products as frozen French fries and potato chips. The province also has a disease-free seed program, guaranteeing high quality seed potatoes. Alberta's high altitude and temperate climate are ideal for growing potatoes; as a result Alberta potatoes have a high dry-matter content and good nutritional and cooking characteristics.

*Harvesting cucumbers on a vegetable farm near Edmonton.*

The commercial vegetable industry in Alberta is divided roughly into two sectors, fresh and processed. Fresh vegetable production in 1986 approached 4,000 acres of primarily storage vegetables which include carrots, cabbage, cooking onions and rutabaga. These storage crops present the greatest potential which is restricted by a shortage of costly storage and handling facilities. More perishable vegetables grown include field cucumbers, cauliflower, Chinese vegetables, broccoli and pumpkin/squash. Sweet corn largely produced in southern Alberta finds markets throughout the entire province. Marketing of all fresh vegetables is one major factor inhibiting expansion of fresh vegetable production. Processing vegetables which include peas, snap beans, corn, carrots and red beets are produced by contract exclusively in southern Alberta. The two processors in the province contract 7,000 acres of processed vegetables. Production constraints in this sector of the industry have resulted from the move by consumers to fresh vegetables and over-production by other competitors who have taken over the main export markets which once existed.

Another large sector of fresh vegetable production in Alberta is market gardening. Market gardening, the production and selling of vegetables and small fruits directly to the consumer either at the farm gate or through Alberta's more than 100 farmers' markets, has steadily increased. Between 300 and 400 market gardeners are spread throughout Alberta, with gardens ranging from one to 50 hectares. Vegetables and small fruits such as strawberries, raspberries and saskatoons are produced.

## Mushrooms

Only a few producers are in the mushroom business, a highly complex and technical enterprise. Per capita consumption has increased dramatically in recent years and Alberta production has increased rapidly to meet the demand. The province is now virtually self-sufficient in mushrooms, producing slightly more than 4,000,000 pounds valued at $4 million.

## Commercial Greenhouses

There are currently about 100 commercial greenhouses in operation, generating close to $19 million in sales. Most are located in or near towns and cities in the south and south-central regions where there are longer days in winter, and where labor and markets are nearby. There are three types of greenhouse operations: the majority produce bedding and potted plants; the second largest group raises vegetables, mainly cucumbers and tomatoes; the third type raises vegetables after the bedding plant season is over. Greenhouse production has not kept pace with the demand because of high production costs and competition from cheaper imports.

# Beekeeping

Alberta's honey is light-colored and has a delicate, subtle flavor that attracts premium prices on domestic and foreign markets. Alberta now produces approximately 30 per cent of Canada's honey. The 1,700 beekeepers in Alberta managed over 181,000 colonies and produced honey and beeswax worth $10.7 million in 1985. Forty per cent of Alberta's honey comes from the Peace River region where the long summer daylight hours and abundance of forage and canola crops for nectar result in high production per colony — 250 pounds per colony is not uncommon. Peace River also has some very large-volume honey operations — many are 1,000 colonies or more.

Commercial apiarists, those with at least 300 hives who derive all or most of their income from beekeeping, comprise 10 per cent of Alberta beekeepers; the rest are hobbyists or sideliners. Alberta bees usually rely on sources such as dandelion and willow early in the gathering season but mainly gather from canola, alfalfa, clover and fireweed at the height of the summer. The bees make an important secondary economic contribution by pollinating forage seed crops. Most beekeepers still buy new bees from California every spring and kill them in the fall, but many are reverting to the practice of keeping their bees over the winter, both outdoors and indoors, bearing the cost of feeding their bees sugar over the winter in order to gain stronger colonies earlier in the spring. Scientists in northern Alberta have recently developed a hardy strain called the Alberta Bee, the use of which is beginning to spread.

Most commercial beekeepers sell their honey in bulk through their own co-operative or private packers. Some, especially hobbyists, pack and sell their own brands directly to the consumer at farmers' markets, retail outlets or at the farm gate. About half of Alberta's honey crop is exported, primarily to the United States; one-quarter goes to other provinces and the remaining quarter is consumed in Alberta.

*Alberta bees usually rely on sources such as dandelion and willow early in the gathering season, but mainly gather from canola, alfalfa, clover and fireweed at the height of the summer.*

# SUGGESTIONS FOR FURTHER READING

The following books are available through your local library or bookstore or may be requested by writing to the address indicated.

**Agriculture Statistics Yearbook**. Edmonton: Alberta Agriculture (Annual). Available from Print Media Branch, Alberta Agriculture, 7000-113 Street, Edmonton, Alberta T6H 5T6

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**Yesterday: a Pictorial History of Agriculture in Alberta**. [s.l.]: Alberta Women's Institutes, 1980. Available from Alberta Women's Institutes, 6604-82 Avenue., Edmonton, Alberta T6B 0E7

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